<u>S.B. 348</u> – Oppose with an alternative in the works

Government Administration and Elections Committee   **Luther Weeks**
Testimony – March 11, 2013   Luther@CTVotersCount.org
                                334 Hollister Way West, Glastonbury, CT 06033

Chairs and members of the Committee, my name is Luther Weeks, Executive Director of
CTVotersCount. Since 2007, I have organized voters, committed to election integrity, to observe
and independently report to you and the public on Connecticut's post-election audits. I have
personally observed over 80 audit counting sessions in municipalities across Connecticut.

I oppose S.B. <u>348.</u> <u>It would make Connecticut the 1ˢᵗ state to effectively eliminate post-election</u>
<u>audits.</u> <u>It is the same bill approved in committee last year. Please do not make that mistake again.</u>

<u>I am working with the Registrars of Voters of Connecticut (ROVAC) to propose a bill that would</u>
<u>strengthen the audits and provide almost the same savings to municipalities.</u> I believe we are close,
yet, we have not reached agreement on all of the details.

We need random audits of voting machines for the same reasons that we inspect trucks, bridges,
and airplanes. Because mechanical systems, no matter how well designed can break down over
time.

We need random audits of voting machines for the same reasons that we audit tax returns, and
campaign expenditures. Because humans are fallible, make mistakes, and take short cuts; if there
is no random checking, some will likely commit fraud. Random auditing deters fraud and
prevents errors by encouraging care and compliance.

Post-election audits are different than other audits for several reasons:

- Unlike other audits <u>they are not independent.</u> They are conducted by the same officials who
  are responsible for conducting the elections, specify the election equipment, and select vendors
  to program them.

- Unlike financial audits, such as bank audits or campaign finance audits, <u>because of the secret</u>
  <u>vote, there are no independent records</u> similar to bank statements which can be compared with
  other financial records of the entity being audited. Election audits must be compared against
  the paper ballots held by election officials.

- <u>Thus, audits and recounts must be conducted publicly and transparently, providing for public</u>
  <u>verification. Without that they cannot be trusted. Without that they cannot provide credibility</u>
  <u>for our elections, that is, credibility for our democracy.</u>

Your predecessors in the Generally Assembly mandated audits and publicly transparent audits, in
order to protect democracy, to provide justified confidence in our elections to candidates and to
the public. <u>This bill would reduce that commitment by cutting the current audits in half with no</u>
<u>corresponding improvements. The audits should be strengthened, not weakened.</u>

Further, <u>this bill would void much of the value of the audits by allowing the manual counting of</u>
<u>ballots to be accomplished by a duplicate scanner and memory card.</u> Such a change would not
detect memory card or scanner program errors, nor would it detect fraud.

<u>We are on the verge of being able to automate the audit process.</u> Commercial products were to be tested in recent elections in four states, open source systems are being developed by OpenCount, and an alternative system has been developed under a PEW grant by the University of Connecticut and our own Secretary of the State's Office. These systems would not eliminate the need for manual audits, but if used responsibly, would dramatically reduce the work involved for a transparent, credible audit.

<u>We are ready to work with the Committee, Registrars, and the Secretary of the State to strengthen the audits and to reduce the work and frustration for election officials, yet in a responsible way.</u>

Based on official reimbursement requests from registrars in Connecticut we estimate the total annual cost for existing random audits of elections and primaries to be in the range of $100,000 to $150,000 per year or about $0.05 per voted ballot -- a fraction of the cost of just printing ballots, let alone election-day costs. At most, this bill would save half that amount statewide, perhaps $50,000 to $75,000 annually.
http://ctvoterscount.org/what-did-the-november-2008-post-election-audit-cost/

<u>Let Connecticut not be known as the first state in the nation to effectively eliminate post-election audits.</u>

Today I provide the additional information relevant to S.B. 348

Page 3 – 7:
Two pre-publication papers provided by three leading experts in the field of post-election auditing, articulating <u>why re-tabulation by a second machine is an inadequate substitute for a manual audit.</u> They also explain an alternative, efficient "Machine Assisted Audit" alternative:

- o **Professor Philip B. Stark, Chair, Department of Statistics, U.C. Berkley**
  http://statistics.berkeley.edu/~stark/

- o **Professor Ronald L. Rivest, Department of Computer Science, MIT, and Turing Award Recipient** http://people.csail.mit.edu/rivest/bio.html

- o **Professor Mark Lindeman, Political Scientist, Adjunct Columbia University**
  http://www.columbia.edu/cu/bulletin/uwb/subj/POLS/W4911-20131-001/

- **Pages 7 – 9:**
  Testimony by leading scientists to the GAE in 2010 on a similar bill

As I said in my testimony on March 11, 2013:

> *"Let Connecticut <u>not</u> be known as the first state in the nation to effectively eliminate post-election audits."*

Thank You

Machine Retabulation is not Auditing
Mark Lindeman, Ronald L. Rivest[*], and Philip B. Stark
24 March 2013

- A **post-election vote tabulation audit** checks election results by manually inspecting some voter-verified records (usually paper ballots). A well-designed audit can produce strong evidence that election outcomes are correct—and can correct incorrect outcomes.

- The principle of **evidence-based elections** says that an election should provide convincing evidence that election outcomes are correct. True audits allow observers to see directly how well the voting system performed, which can provide such evidence.

- Some claim that election results can be checked by **machine retabulation**, in which ballots are rescanned on other equipment. Machine retabulation may happen to catch some errors, but it is not really an audit. Machine retabulation relies on the false assumption that two machines can't *both* be wrong.

- Some claim that retabulation adequately checks the voting system because it is "independent" of the voting system. But a retabulation system could be misconfigured in the same way as the voting system, could misinterpret some ballots in the same way, or could be subverted to cause it to report the same incorrect results. Two unaudited machine counts are not necessarily better than one.

- Some claim that retabulation can adequately check the voting system results provided that the two sets of vote counts match in sufficient detail. This is like claiming that if two expense reports list the same expenses, both must be right and there is no reason to look at any receipts.

- Some claim that retabulation itself can be "audited" by comparing ballot images produced by the retabulation system with the system's interpretation of those images. At best, this tests internal consistency: whether two parts of the retabulation system agree with each other. It does not test whether the system correctly interpreted the ballots. At worst, a subverted retabulation system could pass this test, yet misreport *every* vote. This is not an audit. It cannot confirm that the election outcome is correct.

- A well-designed retabulation system can help in a **machine-assisted audit**. In a machine-assisted audit, the retabulation system produces an interpretation of votes on each ballot (a Cast Vote Record, or CVR) that can be matched with that ballot. The CVRs are exported from the retabulation system. Observers verify that these exported CVRs produce the same electoral outcome (winners, etc.) as the voting system. Then observers compare a random sample of actual ballots against the corresponding CVRs. *This comparison is between actual ballots and CVRs, not between digital images of ballots and CVRs.* A machine-assisted audit can produce strong evidence that election outcomes are correct. Retabulation cannot, even if the CVRs are checked against the digital images of the ballots.

- There is currently no way to audit votes cast online, and there is little prospect for the foreseeable future. Despite claims about "military grade encryption," Internet voting does not create a durable, voter-verifiable record against which the results can be checked. While votes cast on the Internet could be retabulated, they cannot be audited. Both NIST and the Department of Homeland Security agree that secure online voting does not currently exist, and—if it is possible at all—is a long way off.

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[*] Viterbi Professor of Electrical Engineering and Computer Science, MIT
Professor, Department of Statistics, University of California, Berkeley

Retabulations, Machine-Assisted Audits, and Election Verification

by Mark Lindeman, Ronald L. Rivest, and Phillip B. Stark. 20 March 2013

Introduction

In a **machine retabulation** (hereafter just "retabulation"), ballots cast in an election are rescanned and reinterpreted to produce new vote counts. A retabulation may be complete (all ballots are rescanned) or partial (e.g., ballots in some election districts or precincts are rescanned). Some retabulations produce records of the votes purportedly cast on each ballot: Cast Vote Records, or CVRs.

Some jurisdictions around the country use retabulations in lieu of manual recounts. Other jurisdiction are considering machine retabulations as a routine method of checking voting system results. For instance, Connecticut currently requires a manual post-election audit, in which votes cast in several contests in at least 10% of election districts statewide are counted by hand, but it is considering legislation to replace the manual audit with a retabulation.

Reliance upon a machine retabulation violates best practices for post-election audits. It even violates the common definition of a post-election audit, which entails **manually inspecting** some ballots (or voter-verified paper audit records). A manual audit provides a human-observable check on the vote tabulation that does not depend upon the trustworthiness of any hardware or software component.

Machine-assisted audits (Calandrino et al., 2007) that combine retabulations with manual audits, if properly designed, have real advantages over both unaudited retabulations and hand counts of entire precincts or other large "batches" of ballots. As we explain further below, a machine-assisted audit crucially entails manually comparing a random sample of ballots with the machine interpretation of each ballot. Relying on unaudited retabulations is dangerous and unwarranted.

Software independence and retabulations

A voting system is **software-independent** if an undetected change or error in its software cannot cause an undetectable change or error in an election outcome (the winner[s], or whether a runoff is needed). ("Software independence" was initially defined in Rivest and Wack, 2006; Rivest, 2008.) Software independence implies that people do not have to trust that the voting system tabulated votes as it should: At least some people can observe whether it did. Auditing methods should be designed to leverage software independence, by verifying the voting system's performance without relying upon the correctness of its software.

A machine retabulation system without a manual audit squanders the benefit of software independence. Instead of demanding trust without evidence that the voting system performed correctly, it demands the same unsupported trust of the retabulation system. Such a system constitutes poor IT design and poor public policy. Relying on unaudited retabulations is like insisting that because two computerized expense reports agree, there is no reason to check the receipts.

Retabulation can detect some kinds of voting system errors, in some circumstances. If the retabulation results differ materially from the voting system results, then at least one set of results must be wrong, and an audit or hand count can reveal which one(s). A retabulation may detect certain inadvertent errors such as double-scanning some ballots, or some configuration errors.

However, even a close correspondence between two sets of machine counts cannot demonstrate their accuracy—no matter how "independent" the counts are said to be. Similar systems are subject to making similar errors. Even apparently dissimilar systems may have similar software defects, or may misinterpret certain kinds of ballots in

the same way, or may be subject to subversion that causes them to report the same incorrect results. The purpose of auditing a machine system—whether it is the voting system or a retabulation system—is to determine the system's accuracy through observation, rather than depending upon assumption or speculation.

Wishful claims for retabulations

Two other misconceptions about retabulations deserve special mention.

One misconception is that if a retabulation system produces sufficiently many subtotals that match (or almost match) the corresponding voting system subtotals, the accuracy of both systems is demonstrated. This approach is somewhat like asserting that we really can verify a computerized expense report by comparing it to another computerized expense report, without checking the receipts, as long as the expense reports match in sufficient detail. In reality, what matters is not how detailed the expense reports are, but whether the reported details stand up against the receipts.

Another misconception is that we can "audit" the retabulation system by checking graphic ballot images stored in the retabulation system against the ballot interpretations (Cast Vote Records) produced by—and, in some cases, stored in—the retabulation system. At best, this process checks the internal consistency of the retabulation system—or part of the retabulation system. At worst, a subverted retabulation system could display arbitrarily many ballot images and correct interpretations thereof, yet *every* vote count could be misreported. Observers should be able to assess the retabulation system's accuracy without relying on the system itself.

Comparing images of ballots to Cast Vote Records cannot provide much evidence that electoral outcomes are correct. To know that outcomes are correct, we must know that the combined error rate of creating the graphic images from the ballots of and converting those images to Cast Vote Records is small. But comparing images to Cast Vote Records checks only the latter: it gives no information about the first rate. Therefore, it cannot confirm that electoral outcomes are correct.

The easiest way to tell whether the combined error rate is small is to measure the paper-to-Cast-Vote-Record error rate directly: to manually compare the original ballots to the Cast Vote Records.

Evidence-based elections and retabulations

Ideally, an election does not merely report results. Rather, it should provide convincing evidence that the reported results are correct. This principle is called *evidence-based elections*. (Stark and Wagner, 2012.) Retabulations cannot provide convincing evidence that outcomes are correct, because they do not examine the ballots, the artifact that the voters themselves had the opportunity to verify correctly reflected their intent. By failing to leverage the Software Independence conferred by voter-verifiable physical ballots, retabulations at best provide negative evidence: they can detect some "smoking guns," but cannot provide affirmative evidence that electoral outcomes are correct. Absence of evidence is not evidence of absence.

Machine-Assisted Audits

Audits that compare individual ballots to the voting system's interpretations of those ballots (Cast Vote Records, or CVRs) can be far more efficient than audits that hand-count all ballots in selected precincts or other batches. However, these **ballot-level comparison audits** are intractable on many voting systems, which either do not record CVRs or do not permit matching each CVR to the corresponding ballot. Therefore, **machine-assisted audits** based on a retabulation may provide more rigorous audits with less effort than alternative approaches. (Machine-assisted audits were first described in Calandrino et al., 2007.)

A machine-assisted audit, also known as a transitive audit, follows these basic steps:

- All the ballots are reinterpreted by a retabulation system that supports ballot-level auditing. For instance, the system may produce CVRs in the same order as they are rescanned, so, say, the 34th ballot corresponds to the 34th CVR. It may even stamp an identifying number on each ballot before or after the ballot is rescanned.
- If the retabulation system does not produce the same election outcome (e.g., winners) as the official voting system, the audit cannot proceed; a full hand count should be conducted to resolve the discrepancy.
- If the retabulation system does produce the same outcome as the official system, then the retabulation system is audited. First, the CVRs produced by the retabulation system are **committed to**: exported in some manner that allows observers to confirm that they are not altered at any point during the audit. The exported CVRs are retallied, using one or more methods independent of the retabulation system, so that observers can confirm that the CVRs correspond with the vote totals produced by the retabulation system.
- Ballots are randomly sampled, and each ballot in the sample is manually compared with the corresponding retabulation CVR. (The number of ballots sampled depends on the audit method, on the desired level of confidence in the electoral outcome, and, generally, on the results of the comparisons.)
- If the audit produces strong evidence that the retabulation system reported the correct outcome, then it likewise provides strong evidence that the official system was correct, since the two reported the same outcome.

In particular, if the audit of the retabulation system is a risk-limiting audit, then this approach provides a risk-limiting audit of the original system. A risk-limiting audit has a large, predetermined minimum chance of leading to a full hand count if a full hand count would report a different outcome than the system being audited. For a further discussion of risk-limiting audits in general and machine-assisted (transitive) audits in particular, see Bretschneider et al., 2012.

Crucially, a machine-assisted audit does not rely upon the accuracy of the retabulation, but rather verifies it, in two steps: (1) Confirm that the CVRs produce the totals reported by the retabulation; (2) Manually confirm a high degree of correspondence between the CVRs and the corresponding ballots. Additional procedures may be implemented to provide insight into the performance of the voting system and/or the retabulation system.

It is also possible to perform a *partial* retabulation combined with a manual audit of that partial retabulation. If the manual audit is large enough, this approach can be almost as effective as a hand count of the retabulated ballots. How this approach compares to a comprehensive machine-assisted audit depends on the breadth of the partial retabulation, but in general it cannot provide as much evidence that electoral outcomes are correct.

Typically, most of the time and effort of a machine-assisted audit is in the initial retabulation: re-scanning the ballots, creating Cast Vote Records, and computing contest results from the Cast Vote Records. Manually comparing a relatively small number of those ballots to the corresponding CVRs is, in comparison, a modest task, which can be observed by many people, and can be tailored to meet constraints of time and budget. If a retabulation system supports ballot-level manual auditing, skipping this manual verification step makes little sense, since it takes little additional work to produce much stronger evidence that the retabulation is correct. If the system does not support ballot-level manual auditing, we would advise against adopting it.

References

- Bretschneider, Jennie, et al. 2012. Risk-limiting post-election audits: why and how. October 2012 (version 1.1). Available at http://statistics.berkeley.edu/~stark/Preprints/RLAwhitepaper12.pdf.
- Calandrino, Joseph A., J. Alex Halderman, and Edward W. Felten. 2007. Machine-Assisted Election Auditing. Extended version of paper presented at the 2007 USENIX/ACCURATE Electronic Voting Technology Workshop (EVT '07), August 2007. Available at http://www.cs.princeton.edu/~jcalandr/papers/maea-full07.pdf.

- Rivest, Ronald L. 2008. On the notion of "software independence" in voting systems. *Philosophical Transactions of the Royal Society A* 2008 (366), 3759-3767. Available at http://people.csail.mit.edu/rivest/pubs/Riv08b.pdf.
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- Stark, P.B., and D.A. Wagner, 2012. Evidence-Based Elections. *IEEE Computing Now*, *10*, 33–41. http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=6203498 (preprint: http://statistics.berkeley.edu/~stark/Preprints/evidenceVote12.pdf)

TESTIMONY
March 12, 2010

Connecticut Government Administration and Elections Committee,

We are gravely concerned about an amendment to Senate Bill 364 that would replace Connecticut's recently enacted law for hand-counted audits of computer vote tallies with machine re-tabulation, and would require manual counts only when machine tallies differ. This proposal should be discarded and the original requirement upheld.

The practice of hand-counting a random sample of ballots and comparing the results to original electronic tallies is nearly as old as machine vote counting itself. As of June 2009, a majority of the States, including Connecticut, have either conducted hand-counted audits of electronic vote tallies in recent elections, or have enacted statutes that will require them to begin doing so in 2010.[1] Some of those provisions are several decades old, set in place when electronic tabulation of votes was initiated.

There is a sound technical basis for verifying electronic vote tallies by manually counting a sample of precincts or vote subtotals. As computer scientists and election experts, we know very well that there is no reliable way to ensure that a security-critical computer system, such as a vote scanner, is free of malicious software that can change votes -- or is even bug-free, for that matter.

It has been shown time and time again that there is a clever way to defeat every defense that has been invented. Furthermore, basic errors and gross security holes have been exposed in every existing voting device examined by computer security professionals to date. Errors are routinely detected in elections -- and many smaller errors are probably missed. In 2008, hand-counted tabulation audits have discovered errors that led to incorrect vote totals.[2] Computers can greatly increase the convenience and accuracy of elections -- but only if we double-check the results independently of the hardware or software by hand counting a randomly selected sample of the ballots.

Under Senate Bill 364, election officials would use the same vendor's scanners, with the same ballot definitions, as are used to tally votes on election night. Re-tabulation of ballots by another computer device is subject to the same errors and, especially, potential corruption of software as the devices that performed the initial count. If the devices used to re-tabulate come from the same manufacturer; contain all or some of the same hardware, software, or ballot definition files; or have been maintained by the same personnel at the same sites prior to the election, then that re-tabulation is of no value in verifying the election. Senate Bill 364 would offer no meaningful reassurance that computer vote tallies are correct.

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1   Summary of State Manual Audit Provisions, Verified Voting Foundation, May 2009.
    http://verifiedvoting.org/audits
2   Mary Pat Flahorty, *Ohio Voting Machines Contained Programming Error that Dropped Votes*, The Trail: A Daily Diary of Campaign 2008 Washington Post Blog, Aug. 21, 2008,
    http://voices.washingtonpost.com/44/2008/08/21/ohio_voting_machines_contained.html
    Thaddeus Greenson, *Registrar of Voters Considers Dumping Equipment*, EUREKA TIMES-STANDARD, Dec. 22, 2008, at 1.

The cost of audits is minimal: election officials in Minnesota recently reported a cost of 9 cents per audited vote in the 2008 post-election audit, a figure consistent with reports from other States. Election officials who have been reluctant to conduct audits have remarked after completing them that they are not an excessive burden and help reinforce voter confidence.[3]

We respectfully urge you to preserve the important work you have done to reinforce voter confidence and electoral integrity in Connecticut, and leave in place Connecticut's manual count provision.

Sincerely,

David L. Dill
Professor of Computer Science, Stanford University and Founder of VerifiedVoting.org
http://verify.stanford.edu/dill

Jeremy Epstein, SRI International
http://www.visualcv.com/jepstein

Michel J. Fischer,
Professor of Computer Science, Yale University
http://cs-www.cs.yale.edu/homes/fischer/

Professor Candice Hoke, Election Law Professor, Cleveland State University; Director, Center for Election Excellence
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Peter G. Neumann, Moderator of the ACM Risks Forum, Principal Scientist
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Barbara Simons, IBM Research Staff Member (retired)
IBM Almaden Research Center
http://www.verifiedvoting.org/article.php?id=2074

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3 "Eyes on the Vote Count: Non-partisan Observer Reports of Minnesota's 2008 Post-Election Audit and Recount." Citizens for Election Integrity MN, May 2009, p. 34.
http://ceimn.org/files/ceimn.MN_audit_recount.report.May_26.2009.pdf; Sean Greene, "State-Mandated Audit a Success, Officials and Advocates Say," Electionline Weekly, December 14, 2006. Retrieved from http://www.ceimn.org/news/minnesota_performs_first_post_election_review_0

TESTIMONY
March 12, 2010

Connecticut Government Administration and Elections Committee,

Senate Bill 364 appears to be based on the flawed premise that simply rerunning paper ballots through vote counting scanners used for the initial count can replace the manual audits currently required by law. Unfortunately, this assumption is wrong. Because the proposed rescan is not an audit, it will not achieve the goals for which the manual audit was intended. I urge the legislature to retain the manual hand counts in the existing audit legislation.

The primary purpose of post-election audits is to check tabulation results reported by computerized voting systems, just as the purpose of a business audit is to check financial results reported by that business. Post-election audits are motivated by the knowledge that computers can and do fail. This is not some abstract theory. There are real world examples of ways in which computerized voting systems can miscount election results.

Once a computer has been programmed, it will essentially produce the same result every time it is given the identical input, even when using a different computer of the same model, with an identical or similar memory card. This means that if a voting system contains incorrect or election-rigging software, rerunning the same ballots through an identical compromised counting system will result in the same incorrect tally.

That is why computer experts call for manual audits of voting systems. They know that both software errors and clever election-rigging software can be difficult to detect.

We need to hold our elections to the same standards that we demand of our businesses. This means that we must conduct routine post-election manual audits of election outcomes.

Sincerely,

Barbara Simons, Ph.D.

For identification, only:
Barbara Simons is on the Board of Advisors of the U.S. Election Assistance Commission and the Board of Directors of VerifiedVoting.org. She was a member of the workshop, convened at the request of President Clinton, that produced a report on Internet Voting in 2001. She also co-authored the report that led to the cancellation of Department of Defense's Internet voting project (SERVE) because of security concerns. Simons, a former ACM President, co-chaired the ACM study of statewide databases of registered voters, and co-authored the League of Women Voters report on election auditing. She is co-authoring a book on voting machines with Doug Jones. Simons is retired from IBM Research.

Strengthening our post-election audits, and cutting the work by approximately 40%

Our current audits have many weaknesses. The good news is that many of those weaknesses can be remedied without significant additional effort. Also improved procedures and training for the audits will pay off in accuracy, efficiency, and less recounting.

In our opinion, it would be a reasonable trade-off to make the following improvements in the post-election audits in return for a reduction in the randomly selected districts from 10% to 5%:

- Subject all originally machine counted ballots in selected districts to the audit, including polling-place voted, absentee, early voting, and Election Day Registration ballots. This would represent a 10% increase in the number of ballots counted and perhaps a 12% increase in the effort for the audit where central count absentee ballot counting occurs, and less than 10% increase in the effort where polling place absentee ballot counting is used. Overall, the current level of effort would still be reduced by 40%.

- It is important that all voting machines be subject to selection for audit. Central count absentee ballot machines require a more complex setup than polling place machines. If EDR is as successful in Connecticut as in other states, it could represent 20% or more of the vote. Should Connecticut adopt early voting we could expect that 40% or more of our votes would not be polling-place machine counted, further rendering the current law far from adequate.

- Subject all contests on the ballot to audit, not just races. Exempt races without opposing candidates from the audit.

- Have registrars randomly select the contests for audit, separately for each district, at the beginning of the municipal audit counting session, for every election and primary. This will make the audits much more inclusive and transparent, with the selection more clear and uniform. There would be no impact on the amount of counting, with just a little more to be done at the start of the audit.

- Require in the law a three workday public notice of the date, time, and location of audit counting sessions and some way that the public, including the Coalition could easily find this information for all the towns. This would be a minor additional requirement for registrars. It has been an ongoing problem for the Coalition to get information from towns with very part time registrars, and occasionally a couple of registrars that seem to be actively working to avoid the public finding this information prior to the counting. Perhaps, public notice and informing the SOTS Office and the town clerk at least three full business days in advance would be sufficient.

- Require in the law that all reports be filed with the SOTS office within 24 hours of the completion of the counting sessions for a town. Currently some reports have yet to be filed years after the completion of local counting.

- Place in law the rights of observers, now contained in SOTS procedures.

- Require that machine tapes, district and central AB Moderators Returns be available for review by the public at the audit.

- Require random drawing of districts to be performed by the SOTS at least five business days before the start of the audit counting period. This change should be welcomed by registrars as well as advocates.

Let me add that advocates are disappointed in the quality and efficiency of counting methods in use in towns. It makes me cringe when I see committed people do so much work that could be done more efficiently, more accurately, and less stressfully. In this November 2012 audit especially, several registrars requested and encouraged that I publish advice on counting to help them.

*"Auditing election results isn't just a good idea, **it's absolutely essential in order to guarantee the integrity of our elections,"** said Secretary Merrill. "We don't just ta ke the machines' word for it. So we will have every ballot cast in **a full 10% of precincts** using optical scan machines **hand counted** and matched against the machine totals..."*- Press Release Nov 20, 2012

*"**but we don't simply accept the optical scanners' word for it,"** said Secretary Bysiewicz. "The independent audits ensure that each vote was counted properly this month and give confidence to the people of Connecticut that our election process is secure and accurate...Auditing election results isn't just a good idea, it's absolutely essential in order to guarantee the integrity of our elections," said Secretary Bysiewicz. "So we will have every ballot cast in **a full 10% of all our precincts hand counted** and matched against the machine totals"* .- Press Release Mar 23, 2010

Connecticut Citizen Election Audit Coalition Reports: http://CTElectionAudit.org

The necessity of comprehensive manual, hand counted audits:

H.R. 12 -- Co-Sponsored by all 5 Connecticut U.S. Representatives
http://thomas.loc.gov/cgi-bin/query/F?c113:1:./temp/~c113COy0Wc:e117900

> *"(i) PAPER BALLOT REQUIREMENT- (I) The voting system shall require the use of an individual, durable, voter-verified, paper ballot of the voter's vote that shall be marked and made available for inspection and verification by the voter before the voter's vote is cast and counted, and which shall be counted by hand or read by an optical character recognition device or other counting device. ...*
>
> *(iii) MANUAL COUNTING REQUIREMENTS FOR RECOUNTS AND AUDITS- (I) Each paper ballot used pursuant to clause (i) shall be suitable for a manual audit, and **shall be counted by hand in any recount or audit conducted with respect to any election for Federal office.** "*

Principles and Best Practices for Post-Election Audits: http://www.electionaudits.org/principles

> *"Ideally, post-election audits use **hand-to-eye** counts of voter-marked, voter-verified paper ballots. "*

Report on Election Auditing, League of Women Voters of the United States
http://www.lwv.org/content/report-election-audits-task-force

> *"Audits should incorporate totals from all jurisdictions and all ballot types including those cast at early voting sites and on Election Day at the polls, absentee, mail-in and accepted provisional ballots"*
>
> *"Ideally, post-election audits use **hand-to-eye counts** of voter-marked optical scan ballots or VVPATs, including those produced by ballot generating devices or ballot marking devices. "*

Post-Election Audits: Restoring Trust In Elections, The Brennan Center For Justice
http://brennan.3cdn.net/f1867ccc368442335b_8em6bso3r.pdf

> *"AUDIT ALL METHODS OF VOTING. In conducting post-election audits, election officials should not exclude any category of votes (e.g., absentee ballots, provisional ballots, damaged ballots). Audits must be comprehensive to ensure that both error and fraud can be readily detected. Although voters cast the majority of ballots on polling place equipment, many jurisdictions increasingly see significant numbers of other ballot types, including early, absentee, provisional and emergency ballots...*
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> *specific guidelines are needed to ensure that observers will be able to actually see each vote counted. "*